ARIZONA DEPARTMENT OF TRANSPORTATION * MATERIALS GROUP

1221 NORTH 21ST AVENUE PHOENIX, ARIZONA 85009-3740 PHONE (602) 712 - 7231

POLICY AND PROCEDURE DIRECTIVE

James P. Delton
Assistant State Engineer

TO: ALL MANUAL HOLDERS	PPD NO. 13
SUBJECT: CERTIFICATION AND ACCEPTANCE OF HYDRAULIC CEMENTS, FLY ASH, NATURAL POZZOLAN, SILICA FUME, AND LIME	EFFECTIVE DATE: February 27, 2009

1. GENERAL

1.1 This Policy and Procedure Directive supersedes P.P.D. No. 04-4.

1.2 This Policy and Procedure Directive outlines the procedures to be followed for certification and acceptance of hydraulic cements, fly ash, natural pozzolan, silica fume, and lime.

1.3 This Policy and Procedure Directive modifies the normal certification procedures for hydraulic cements, fly ash, and natural pozzolan used in Portland Cement Concrete. It shall be used in conjunction with the requirements of Subsection 106.05 of the Specifications.

2. CERTIFICATION AND ACCEPTANCE OF HYDRAULIC CEMENT, FLY ASH AND NATURAL POZZOLAN FROM DOMESTIC SOURCES FOR USE IN PORTLAND CEMENT CONCRETE

2.1 The certification and acceptance of hydraulic cement, fly ash, and natural pozzolan from domestic sources will be on the basis of the material originating from an Approved Material Source. However, the Department reserves the right to sample and test material for acceptance from any source without notification.

2.2 Source approval of hydraulic cement plants, and fly ash or natural pozzolan producers/suppliers, will include the satisfactory submittal to Materials Group, Structural Materials Testing Section, on a monthly and timely basis, of an original Certificate of Compliance on the lots produced during that month. In addition, a copy of the Certificate of Analysis shall be supplied to Materials Group, Structural Materials Testing Section, for either: 1) each lot produced during that month, or 2) lots produced during that month that are used on any ADOT construction project. The referenced Certificate of Compliance and Certificate of Analysis are separate documents and not to be combined. Examples of typical Certificates of Compliance and Certificates of Analysis are given in the attachments to this Policy and Procedure Directive. Attachment #1 gives an example of a typical Certificate of Compliance for cement. Attachment #2 gives an example of a typical Certificate of Analysis for

cement. Attachment #3 gives an example of a typical Certificate of Compliance for fly ash. Attachment #4 gives an example of a typical Certificate of Analysis for fly ash. Typical Certificates of Compliance and Certificates of Analysis for natural pozzolan would be similar to Certificates of Compliance and Certificates of Analysis for fly ash.

2.3 In addition to the certification requirements given above, a report shall be submitted to Materials Group, Structural Materials Testing Section, showing the statistics on the Chemical and Physical Requirements as given in ASTM C 150 for Portland cements, ASTM C 595 for blended hydraulic cements, or ASTM C 618 for fly ash and natural pozzolan. This report will be current and prepared for each source of material with a time interval of not more than one year.

2.4 A withdrawal of source approval may be instituted for any of the following reasons:

(a) If the materials fails to comply with specification requirements.

(b) If the material source fails to provide the required documents to the Department as specified for the source approval on a regular and timely basis.

(c) If the source does not furnish material to the Department for a period of one year.

2.5 Commercial concrete producers or contractors that supply concrete to any ADOT construction project shall have the hydraulic cement, fly ash, or natural pozzolan come from approved sources. In addition, commercial concrete producers or contractors shall advise the construction project in writing as a part of the mix design approval process as to the source and type of hydraulic cement, fly ash, or natural pozzolan.

2.6 The Approved Materials Source List for "Hydraulic Cements" and "Fly Ash and Natural Pozzolan" is maintained by Materials Group, Structural Materials Testing Section. The current list is available on the Materials Group Structural Materials Testing Section homepage through the ADOT internet website.

3. CERTIFICATION AND ACCEPTANCE OF HYDRAULIC CEMENT, FLY ASH AND NATURAL POZZOLAN FROM FOREIGN SOURCES FOR USE IN PORTLAND CEMENT CONCRETE

3.1 The certification and acceptance of hydraulic cement, fly ash, and natural pozzolan from foreign sources will be in accordance with the requirements specified in Section 2 above for domestic sources, with the additional requirement for sampling and testing given below.

3.2 One sample shall be taken weekly from a distributor's storage facilities. A partial test shall be conducted from a random selected sample each month and a complete chemical and physical test shall be performed every three months. A partial test shall include the tricalcium aluminate (C_3A) and alkalies determination plus the standard physical tests for hydraulic cements. A failing test result will result in the removal from the Approved Material Source List. This suspension from the list shall be until such time that the hydraulic cement producer can demonstrate that the quality control has corrected the deficiency in the material and the product meets specification requirements.

4. CERTIFICATION AND ACCEPTANCE OF SILICA FUME FOR USE IN PORTLAND CEMENT CONCRETE

4.1 When silica fume is used in Portland cement concrete, it shall conform to the requirements of ASTM C 1240.

4.2 A Certificate of Compliance conforming to the requirements of Subsection 106.05 shall be submitted for each delivery of silica fume.

4.3 No samples of silica fume are required.

4.4 The Department reserves the right to sample and test material which has been accepted on the basis of a Certificate of Compliance.

5. CERTIFICATION AND ACCEPTANCE OF PORTLAND CEMENT, BLENDED HYDRAULIC CEMENT, OR HYDRATED LIME FOR USE AS A MINERAL ADMIXTURE IN ASPHALTIC CONCRETE MIXES

5.1 Portland Cement shall meet the requirements of ASTM C 150 for Type I or Type II cement. Blended Hydraulic Cement shall meet the requirements of ASTM C 595 for Type IP cement. Hydrated Lime shall meet the requirements of ASTM C 1097.

5.2 A Certificate of Analysis conforming to the requirements of Subsection 106.05 shall be submitted for each delivery of Portland cement, blended hydraulic cement, or hydrated lime.

5.3 No samples of Portland cement, blended hydraulic cement, or hydrated lime are required.

5.4 The Department reserves the right to sample and test material which has been accepted on the basis of a Certificate of Analysis.

6. CERTIFICATION AND ACCEPTANCE OF LIME OR PORTLAND CEMENT FOR USE IN SOIL STABILIZATION

6.1 When lime is used for soil stabilization, the lime shall conform to the requirements of Section 301 of the ADOT Specifications.

6.2 When Portland cement is used for soil stabilization, the Portland cement shall conform to the requirements of Section 1006 of the ADOT Specifications.

6.3 A Certificate of Compliance conforming to the requirements of Subsection 106.05 shall be submitted for each delivery of lime or Portland cement.

6.4 No samples of lime or Portland cement are required.

6.5 The Department reserves the right to sample and test material which has been accepted on the basis of a Certificate of Compliance.

7. CERTIFICATION AND ACCEPTANCE OF PORTLAND CEMENT AND HYDRATED LIME IN MORTAR OR GROUT

7.1 Portland cement used in mortar or grout shall conform to the requirements of Section 1006 of the ADOT Specifications.

7.2 Hydrated lime used in mortar or grout shall conform to the requirements of ASTM C 207, Type N.

7.3 A Certificate of Compliance conforming to the requirements of Subsection 106.05 shall be submitted for each delivery of Portland cement and hydrated lime.

7.3 No samples of Portland cement or hydrated lime are required.

7.4 The Department reserves the right to sample and test material which has been accepted on the basis of a Certificate of Compliance.

James P. Delton, P.E.
Assistant State Engineer
Materials Group

Attachments (4)

ARIZONA PORTLAND CEMENT COMPANY

A Division of California Portland Cement Company
Manufacturers of Arizona Cements
P. O. Box 338
Rillito, Arizona 85654-0338
Tel: (520) 682-2221 Fax: (520) 682-4345

MANUFACTURER'S CERTIFICATION

Mr. Don Rushton, P.E.
ADOT/Materials Divison
1221 N. 21st Avenue
Phoenix, AZ 85009

We hereby certify that the following Type I/II, Low Alkali, Portland Cement lots have been shipped from the Arizona Portland Cement Company, Rillito Cement Plant, Rillito Arizona. All Type I/II cement lots shipped from Rillito, Arizona and meet or exceed the current ASTM C-150 specifications for Low Alkali Cement.

Individual certifications can be obtained with each load upon request and delivered to your plant sites. These certifications will contain pertinent data including shipping lot number.

The Shipping Lot Numbers for the Month of **JUNE 2003** are as follows:

15132	16132	17132
15231S	16232	17232
15332	16332	17532
15432	16432	17632
15532	16732	17732
15632	16832	17932
15732	16932	18132
15832	17032	18232

* Lot testing data from composite shipping sample

John Bartolucci

John A. Bartolucci
Quality Control Superintendent

Date Signed: 11-Jul-03

File: Type II Data.doc

ARIZONA PORTLAND CEMENT COMPANY

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Manufacturers of Arizona Cements
P. O. Box 338
Rillito, Arizona 85654-0338
Tel: (520) 682-2221 Fax: (520) 682-4345

CERTIFICATE OF TEST

Arizona Portland Cement Type I/II Low Alkali
A.S.T.M. Designation: C 150

We certify that the test results below of the Low Alkali Cement produced and shipped from the Rillito Plant meet or exceed all current ASTM C-150 requirements and specifications. The following represents the monthly average chemical and physical data for the month of **JUNE 2003.**

CHEMICAL ANALYSIS (Oxides in %)		ASTM C-150 LIMITS		
Silicon Dioxide, SiO_2	20.58	20.0	min.%	
Alumina Oxide, Al_2O_3	4.05	6.0	max.%	
Ferric Oxide, Fe_2O_3	3.45	6.0	max.%	
Calcium Oxide, CaO	62.63	--		
Magnesium Oxide, MgO	4.75	6.0	max.%	
Sulphur Trioxide, SO_3	2.85	3.0	max.%	(C3A less than 8.0)
Loss on ignition	1.01	3.0	max.%	
Insoluble residue	0.46	0.75	max.%	
Alkali Equivalent (%Na_2O+0.658% K_2O)	0.38	0.60	max.%	
POTENTIAL COMPOSITION				
Tricalcium Silicate, $3CaO.SiO_2$ (C3S)		--		
Dicalcium Silicate, $2CaO.SiO_2$ (C2S)	15			
Tricalcium Aluminate, $3CaO.Al_2O_3$ (C3A)	5	8	max.%	
Tetracalcium Aluminoferrite $4CaO.(AlFe)_2O_5$ (C4AF)	11			
PHYSICAL ANALYSIS				
Fineness, Blaine, Specific Surface (m2/kg)	400	280	min. (m2/kg)	
Percent passing 325 mesh screen (45um)	99.1	--		
Compressive Strength, C-109, p.s.i.				
3 day	3750	1450	min. psi	
7 day	4980	2470	min. psi	
28 day (May Data)	6470	--		
Autoclave expansion	0.28	0.80	max.%	
False Set	90.4	50	min.% (optional)	
Vicat time of setting: Initial (minutes)	131	45	min. (minutes)	
Air Content of Mortar (volume %)	7.3	12	max.%	
Water	26.5	--		

Remarks: Apparatus and methods in use in this laboratory have been checked by the National Institute of Standards and Technology. Major oxides are analyzed by X-ray Fluorescence Spectrometry.

John Bartolucci

John A. Bartolucci
Quality Control Superintendent

PHOENIX CEMENT
8800 E. CHAPARRAL ROAD, SUITE 155 • SCOTTSDALE, ARIZONA 85250-2606 • (480) 850-5757 • FAX: (480) 850-5758

July 2, 2003

Arizona Department of Transportation
Materials Division
ATTN: Don Rushton
1221 N. 21st Avenue
Phoenix, AZ 85009

This letter serves as certification that all Four Corners **Fly Ash** (pozzolan) sold by Phoenix Cement Company meets the requirements of ASTM Specification C618 for Class F **Fly Ash** (pozzolan).

LOTS

5514	5515	5516
5517	5518	5519

Respectfully,

Lee Gorby

Lee Gorby
Quality Assurance Manager

PHOENIX CEMENT
8800 E. CHAPARRAL ROAD, SUITE 155 • SCOTTSDALE, ARIZONA 85250-2606 • (480) 850-5757 • FAX: (480) 850-5758

Arizona State Dept of Transportation
Attn: Don Rushton
1221 N 21 St Ave
Phoenix, AZ 85009-3740

Corporate Headquarters
8800 E Chaparral Rd, Ste 155
Scottsdale, AZ 85250
Phone: 480-850-5757
Fax: 480-850-5758

Cement Manufacturing
3000 W Cement Plant Rd
Clarkdale, AZ 86324
Phone: 928-634-2261
Fax: 928-634-3543

Phoenix Transfer Facility
1941 W Lower Buckeye Rd
Phoenix, AZ 85009
Phone: 602-258-7798
Fax: 602-525-3362

21st Avenue Facility
1325 N 21st Avenue
Phoenix, AZ 85009
Phone: 602-254-3824
Fax: 602-254-3825

Mesa Community Storage
Dobson & McKellips
Mesa, AZ 85211
Phone: 480-990-7847

Cholla Fly Ash Facility
P O Box 380
Joseph City, AZ 86032
Phone: 928-288-1661
Fax: 928-288-1663

Four Corners Fly Ash Facility
P O Box 1007
Fruitland, NM 87416
Phone: 505-598-8657
Fax: 505-598-8633

San Juan Fly Ash Facility
San Juan Generating Station
Waterflow, NM 87421
Phone: 505-598-7546
Fax: 505-598-7547

Escalante Fly Ash Facility
CR19 / P O Box 620
Prewitt, NM 87405
Phone: 505-285-4590
Fax: 505-285-4667

Verde Gypsum
Camp Verde, AZ 86322
Phone: 928-567-3854

Product: Class F Fly Ash, 4 Corners Power Plant
ASTM C 618-00

4-25-03

FLY ASH TEST REPORT

Ctl#: 8119

Lot: 5514	Results	Specifications	
Chemical Analysis			
Silicon Dioxide, SiO_2	61.93 %	---	
Aluminum Oxide, Al_2O_3	24.67 %	---	
Ferric Oxide, Fe_2O_3	4.21 %	---	
$SiO_2+Al_2O_3+Fe_2O_3$	90.81 %	70.00	Min
Calcium Oxide, CaO	[illegible] %	---	
Magnesium Oxide, MgO	[illegible] %	---	
Sulfur Trioxide, SO_3	0.11 %	5.00	Max
Moisture Content	0.04 %	3.00	Max
Loss on Ignition	0.43 %	5.00	Max
Available Alkalis as Na_2O	0.51 %	1.50	Max
Sodium Oxide, Na_2O	2.28 %	---	
Potassium Oxide, K_2O	0.99 %	---	
R Factor	-0.46 %		
Physical Analysis			
Fineness, amount retained on #325 sieve, %	17.70	34.00	Max
variation, points from average	0.69	5.00	Max
Density, g/cm³	1.99	---	
Variation from average, %	0.02	5.00	Max
Strength Activity Index with Portland Cement			
at 7 days, % of cement control	82.28	---	
at 28 days, % of cement control	85.80	75.00	Min
Water Requirement % of cement control	95.87	105.00	Max
Soundness, autoclave expansion or contraction, %	-0.01	0.80	Max

All tests have been made in strict accordance with the current standards of the American Society for Testing and Materials covering the type of material specified.

Lee Gorby, Quality Assurance Manager
01 JUL 2003

EXAMPLE